Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

August 10, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Dresden Station Units 2 and 3
Submittal of Appendix R
Reverification Results
NRC Docket Nos. 50-237 and 50-249

References (a): B. Rybak letter to H. R. Denton dated May 18, 1983.

(b): B. Rybak letter to H. R. Denton dated December 23, 1983.

(c): D. M. Crutchfield letter to L. O. DelGeorge dated January 19, 1984.

(d): B. Rybak letter to H. R. Denton dated March 30, 1984.

(e): B. Rybak letter to H. R. Denton dated June 27, 1984.

Dear Mr. Denton:

In reference (b), Commonwealth Edison (CECo) notified the NRC that, because of recent NRC clarifications of Appendix R requirements, an independent review of the Dresden Station Units 2 and 3 fire protection program was initiated. CECo met with members of your staff on June 14, to present the hot shutdown portion of this review and committed in reference (e) to a formal submittal of the results by August 3, 1984. A request for an extension to August 13th was subsequently granted.

Our reverification program is essentially completed; some minor work is still left in the areas of spurious operation, cold shutdown, emergency lighting, exposed structural steel, and NFPA Code reviews, but we believe there are no major concerns in any of these areas. Enclosure I is a summary of the reverification methodology and status. At this stage of our reverification we have found that no major redesign of safe shutdown paths or philosophy is necessitated, and the reverification has not affected previously identified modifications (References (a) and (d)).

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The additional modifications now deemed necessary (see Table 2 of Enclosure II) consist mainly of additional suppression and detection and the upgrading of some fire barriers. The completion of these additional modifications is not constrained by any refueling outage. A completion schedule for them has not been established, however, because we are still completing the necessary engineering work and determining procurement and installation requirements. As for the previously identified modifications, their projected completion dates are as shown in Table 1 of Enclosure II. Please note the only changes are the result of a shift in the refueling outage schedule for both Units 2 and 3.

The schedular requirements for Appendix R modifications are outlined in 10 CFR 50.48. In reference (a), CECo requested schedular exemptions for the previously identified modifications, since we were unable to meet those schedular requirements. Similarly, the schedular requirements cannot be met for the newly identified modifications. Consequently, CECo is also requesting schedular exemptions for these additional modifications. The interim compensatory measures for all of the modifications which cannot be completed within the schedular requirements of the rule are detailed in Table 2 of Enclosure 2. These interim measures have been initiated where necessary to provide an additional level of protection until completion of the modifications, and they will be discontinued as the modifications which established their need are completed.

Our exemption requests for both Reactor Buildings, the Turbine Building, and the Cribhouse are found in Enclosure III. These exemption requests fall into two general categories - (1) the lack of complete 3 hour barriers and (2) the lack of detection and suppression throughout the fire areas. We believe these exemption requests are prudent and justifiable and request your approval of them.

Commonwealth Edison believes this reverification effort demonstrates that in the case of a fire the affected unit or units can be safely shutdown. The additional modifications and exemption requests are needed to meet the literal requirement of Appendix R. Enclosure II entitled "Interim Compensatory Measures" identifies the need for additional modifications and verifies that the plant, as originally modified to meet Appendix R, provides a level of protection sufficient to allow for a reasonable completion schedule for all of the remaining Appendix R work. Although we feel our reverification efforts are thorough and complete, CECo is committed to a continuing evaluation of all the safe shutdown systems and equipment to meet the requirements of Appendix R. Therefore, future compliance measures or exemptions may be necessary as a result of new plant modifications.

Please address any questions you may have regarding this matter to this office.

One signed original and forty (40) copies of this letter are provided for your use. Due to the size and nature of the enclosures, only ten (10) copies of them are provided.

Very truly yours,

D. L. Farrar
Director of Nuclear Licensing

lm

cc: R. Gilbert - NRR (w/o encl.)
NRC Resident Inspector - Dresden (w/o encl.)

Enclosure

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DRESDEN 2&3 APPENDIX R

REVERIFICATION - INTERIM COMPENSATORY MEASURES AND EXEMPTION REQUESTS

DRESDEN 2&3

APPENDIX R REVERIFICATION

INTERIM COMPENSATORY MEASURES

AND

EXEMPTION REQUESTS

DRESDEN 2&3

APPENDIX R REVERIFICATION

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DRESDEN 2&3

ENCLOSURE I

EXECUTIVE SUMMARY

1.0 DRESDEN FIRE PROTECTION PROGRAM

1.1 BACKGROUND

As part of the continuing NRC evaluation following the fire at the Browns Ferry Nuclear Station in March 1975, Commonwealth Edison Company (CECo) has outlined its fire protection program and features at Dresden Power Station in a number of documents submitted to the NRC between 1976 and the present.

The document entitled, "Information Relevant to Fire Protection Systems and Programs-Parts 1-3, April 1977," provided CECo's response to the NRC initial request for a comparison of the fire protection provisions of Dresden Station with the guidelines of Appendix A to BTP 9.5-1. This was CECo's first Fire Hazards Analysis of Dresden Station and resulted in a number of fire protection modifications.

CECo also responded to NRC guidelines regarding nuclear power plant fire protection programs issued in the following documents:

1. Supplementary Guidance on Information Needed for Fire Protection Evaluation, September 30, 1976,

2. Sample Technical Specifications, May 12, 1977, and

3. Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls, and Quality Assurance, June 14, 1977.

Following the review of these CECo submittals and a plant inspection, the NRC staff docketed a Fire Protection Safety Evaluation Report (FPSER) for Dresden Units 2 and 3 in March 1978. A staff letter of February 12, 1981, confirmed that all FPSER items were considered closed with the one exception being "Safe Shutdown Capability."

Implementation of these guidelines resulted in additional fire protection measures being incorporated to enhance the existing fire protection program and satisfy the NRC defense-in-depth philosophy. Many studies and much discussion were also associated with the subsequent NRC fire protection guidelines and requirements.

1.2 APPENDIX R

The fire protection rule, Appendix R of 10 CFR 50, was issued on February 19, 1981, for Dresden Units 2 and 3. At that time the shutdown analyses and subsequent related correspondence for Dresden Station was well underway and being reviewed by

the NRC staff. CECo continued to provide the NRC staff with all necessary information for their review of the station's safe shutdown capability.

On July 1, 1982, CECo submitted the final response and position in Generic Letter 81-12 questions, Safe Shutdown Capability, Associated Circuits, and a listing of the exact shutdown methods and necessary safe shutdown modifications for Dresden Station. Submitted with this enclosure was Dresden Station's Fire Protection Associated Circuits Analysis and Modifications Report. The cable discrepancy report was revised and resubmitted August 16, 1982, as a supplement to the Modifications Report.

Enclosure E of the August 16, 1982 submittal included the first formal exemption request from the requirement of Appendix R Section III.G.3.b for fixed fire suppression. This request was made for 13 fire zones having electrical equipment critical to the power distribution necessary for normal and emergency operation of safety-related equipment for Units 2 and 3 at Dresden. A formal exemption was granted from the requirements of Section III.G.3 on February 2, 1983.

By cover letter dated January 19, 1983, the NRC staff stated that they had completed the review of Dresden 2 and 3 alternate shutdown capability which is used to achieve safe shutdown in the event of a fire. This capability was evaluated against the requirements of Sections III.G and III.L of Appendix R to 10 CFR 50. Based on this review, the NRC staff concluded that Dresden 2 and 3 was in compliance with Appendix R Items III.G.3 and III.L regarding safe shutdown in the event of a fire. A Safety Evaluation Report (SER) was written on this Appendix R review. The conclusion of this evaluation states:

> "We (the NRC staff) have reviewed the licensee's proposed alternate shutdown capability for certain designated areas in Dresden Units 2 and 3 in accordance with Appendix R criteria. Based on that review, we conclude that the performance goals for accomplishing safe shutdown in the event of a fire, i.e., reactivity control, inventory control, decay heat removal, pressure control, process monitoring, and support functions are met by the proposed alternate in these areas. Therefore, we conclude that the requirements of Appendix R Sections III.G.3 and III.L are satisfied in the areas identified in Section 2.2 of this Safety Evaluation."

On the basis of these conclusions, CECo management was confident that the intent of Appendix R has been satisfied and continued working to implement the identified modifications in accordance with 10 CFR 50.48 (c)(4).

On October 19, 1983, Generic Letter 83-33, which reemphasized NRC positions on certain requirements of Appendix R, was transmitted to Dresden 2 and 3. As a result, CECo management decided to perform a reevaluation of the previous analysis to verify that misinterpretations did not exist.

2.0 REEVALUATION OF CECO APPENDIX R POSITION

2.1 PURPOSE

CECo management requested that a detailed, independent outside review of its entire fire protection program be conducted at Dresden. The study was to compare the criteria of Appendix R, with particular attention given to the latest NRC staff positions as presented in Generic Letter 83-33, with the previous Appendix R analysis.

2.2 REEVALUATION TEAM

In October 1983, CECo contracted the services of Professional Loss Control, Inc. (PLC) to conduct an in-depth reevaluation at Dresden Station. PLC was selected to perform this review because of their extensive involvement in all aspects of nuclear power plant fire protection. CECo also contracted the architectural engineering firm, Sargent and Lundy (S&L), to provide the technical support necessary for evaluation of mechanical, electrical, and nuclear systems at the station.

The overall reevaluation team consisted of Mr. Michael E. Mowrer, P.E., Vice President, (PLC); Mr. Christopher A. Ksobiech, Fire Protection Engineer, (PLC); Mr. John W. Dingler, P.E., Group Supervisor Nuclear Licensing Section, (S&L); Mr. John M. Nosko, P.E., Mechanical Project Engineer, (S&L); and Mr. Clayton E. Ruth, P.E., Electrical Engineer, (S&L). Mr. Wayne D. Pierce, Dresden Station Techncial Staff Engineer; Mr. Raymond Christenson, Senior Reactor Operator at Dresden Station; Mr. Ronald E. Roebert, Staff Assistant, and Mr. William H. Koester, Station Nuclear Design Engineer, Station Nuclear Engineering Department; and Mr. Bob Rybak, Nuclear Licensing Administrator for Dresden Station provided the plant specific information, guidance, and support from Commonwealth Edison Company.

Mr. Mowrer acted as the project leader for this reevaluation team. He is Vice President of PLC and a Senior Fire Protection Engineer with over 15 years of experience as a fire protection engineer. Mr. Mowrer is a full member of the Society of Fire Protection Engineers (SFPE), a qualified lead auditor per ANSI N45.2.23, and exceeds the NRC qualifications for a fire protection engineer. He has been involved in nuclear power plant fire protection since 1976 providing services to more than 27 plants in the U.S. and is familiar with all of the fire protection criteria and guidelines established by the NRC.

Mr. Dingler provided nuclear systems information in the analysis. He is familiar with the Dresden Station and is experienced with the Appendix R safe shutdown analyses.

Mr. Nosko provided the mechanical system information for the study. In his position as Mechanical Project Engineer he is thoroughly acquainted with the mechanical systems at the plant and proposed Appendix R modifications.

Mr. Ruth provided the technical input on electrical systems for the detailed analysis. He also coordinated the preparation and review of the cable charts and maps used so extensively during the reevaluation.

Mr. Ksobiech is a graduate Fire Protection Engineer. He provided additional technical fire protection input to the project for PLC.

(Detailed resumes for the project team are presented at the end of this enclosure.)

2.3 METHODOLOGY OF REEVALUATION

The Appendix R reevaluation included the detailed review of the fire protection program and safe shutdown analyses for Dresden Station Units 2 and 3. The fire protection program was reviewed and evaluated not only against Appendix R requirements but also included previous station commitments made in the:

- Fire Hazards Analysis
- Responses to Supplementary Guidance, June 20, 1977, Nuclear Plant Fire Protection Responsibilities, Administrative Controls and Quality Assurance
- Fire Protection Safety Evaluation Report (FPSER)
- Station Technical Specifications
- NFPA Fire Codes (Design, installation and maintenance of fire protection systems)
- Related Correspondence with the NRC.

The adequacy of previous safe shutdown analyses (discussed previously) and related correspondence was verified and revalidated. These CECo responses were reviewed to the latest NRC staff positions and the criteria of Appendix R. Special attention was given to the issues addressed in Generic Letter 83-33.

The reevaluation began with the gathering and/or review of existing necessary data. This data included information on plant fire protection features, combustible loadings, hot and cold shutdown equipment and associated cables. The adequacy of definitions used in the initial analysis was verified as part of the reevaluation. This was done to ensure that items such as associated circuits and spurious valve operations were thoroughly addressed in accordance with NRC direction issued subsequent to the original Dresden analysis.

The station's fire protection systems, both passive and active, are being evaluated for compliance with previous commitments, such as the nationally recognized (NFPA) fire codes. This review included such features as fixed fire suppression, detection, manual hose stations, portable extinguishers, fire barriers, fire dampers, fire doors, and penetration seals. This review provided the basis for identifying the fire protection features available in the plant. This study also included a walkdown of all fire zones to determine the basis for the establishment of the zone (i.e., surrounding barriers, separation, etc.) and to ensure that the fire areas were consistent with NRC definitions.

The fixed combustible loading of each fire zone was recalculated. The calculations were conservative but did not include lubricating grease or negligible oil capacities related to minor equipment. Special note was taken of concentrations of combustibles, their type, and their location in each fire zone with respect to safe shutdown equipment, fire barriers, and openings in barriers.

A clear shutdown path was identified for each fire zone which would not affect the ability of the plant to be safely shut down under any worst reasonable fire scenario. Cable maps were developed for all hot and cold shutdown equipment showing associated cable routing through fire zones. These cable maps were studied to determine the level of separation between available shutdown paths. Fire protection drawings were compiled to illustrate available fire protection features. Previously identified modifications were reviewed to ensure that they adequately addressed Appendix R concerns. Each shutdown path was carefully reviewed to ensure that all necessary manual actions were identified, required instrumentation was available, and that the related time line for manual actions was realistic. Plant personnel verified that sufficient manpower was available to accomplish all necessary actions in addition to the required fire brigade activities.

A careful review was conducted against the guidance of Appendix R Sections III.G and III.L and Generic Letter 83-33. This review revalidated the Associated Circuits Analysis of June 1982 and expanded the analysis to demonstrate that a fire in one fire zone would not adversely affect the ability to shut down the plant even with alternate shutdown equipment located in an adjacent fire zone.

Documentation of the modifications and justification of Appendix R exemptions identified in this review are contained in Enclosures II and III, respectively, of this submittal. A revised Appendix R report is in preparation which will update and replace the Associated Circuits Analysis of June 1982. This report will document in detail the methology and results of the reanalysis including hot shutdown, cold shutdown, potential adverse spurious operation of valves, emergency lighting study, and the structural steel analysis. Documentation of the NFPA code study and the previous commitment review will be available for review.

The few unprotected plant areas which contain unprotected structural steel are now being analyzed in detail to determine if additional fire protection is needed. Results of this study will be submitted upon completion. Additionally, the results of the cold shutdown review, emergency lighting study, and potential spurious valve operation review will be submitted when completed.

It should be noted that the major concerns regarding spurious operation of valves were identified in the Associated Circuits Analysis of June 1982. Procedures and/or modifications were developed to address the identified concerns.

CECo personnel also recognized the need to consider compensatory measures when 10 CFR 50.48(C)(4) could not be satisfied. Those proposed modifications which will not be completed according to the 10 CFR 50.48 schedule have been considered to determine the impact of a fire in the area before completion of the modification. Discussions are included as Enclosure II.

2.4 CONCLUSIONS

A detailed, independent reevaluation of the entire Dresden fire protection program was undertaken by a well qualified project team at the request of CECo management. The results of that study verified the validity of the basic approach and results from the previous Appendix R analysis. The Dresden associated circuit analysis was updated to include all NRC concerns. Previously proposed modifications were found to be appropriate.

As a result of Generic Letter 83-33, it was found that additional fire detection was warranted primarily in the reactor buildings. This additional fire detection will assist the plant operators in deciding which alternate shutdown path remains unaffected. Modifications were also proposed to more clearly demonstrate equivalence to the fire area concept where strict Appendix R compliance could not be achieved.

As a result of the reevaluation and Generic Letter 83-33, it was determined that additional formal exemption requests were necessary. Technical justifications are included in this report for the exemption requests identified during the reevaluation.

PLC *Professional Loss Control, Inc.*

MICHAEL E. MOWRER, P.E.
VICE PRESIDENT

EDUCATION

B.S. Fire Protection Engineering, Illinois Institute of Technology, 1969
Seminar on Quality Assurance Audit Techniques
Management Courses and Seminars

PROFESSIONAL AFFILIATIONS

Registered Professional Engineer, California
Society of Fire Protection Engineers, Member
National Fire Protection Association, Member of Technical Committee

PROFESSIONAL EXPERIENCE

Mr. Mowrer has more than fifteen (15) years of fire protection engineering experience with hazardous industry. He is currently involved in a variety of projects relating to heavy industry, including power plant audits, engineering evaluations, establishment and review of fire detection and suppression system design criteria, fire hazards analyses, development of detailed pre-fire plans for fire brigade use, project management, fire system design, and fire brigade leadership training programs to satisfy OSHA and NRC requirements. He has developed and presented numerous seminars on fire protection for nuclear and fossil power plants, hazardous industry, and fire emergency planning. He is an ANSI N45.2.23 qualified lead auditor.

Previously Mr. Mowrer was Assistant Manager for a large fire protection consulting firm. As such he was responsible for the supervision of fire protection engineers providing services for the hazardous paint and coatings industry. These services included both fire protection system review and chemical process analysis. Additional responsibilities included conducting surveys of municipal fire defense facilities, determining life-safety needs for highrise buildings, evaluation of compliance with OSHA regulations, and review of building construction to determine divergence from national concensus standards.

Before joining the consulting firm, Mr. Mowrer's responsibilities included HPR inspections of high risk sprinklered properties to determine the need for special hazard detection or suppression equipment to improve life safety and property protection. He was also involved in the evaluation of the level of public fire protection provided for a number of communities. Mr. Mowrer has experience as a volunteer fire fighter.

AREAS OF SPECIALIZATION

Project Management
Fire Protection for Electrical Power Generating Facilities (nuclear & fossil fuel)
Design and Evaluation of Fire Detection and Suppression Systems
Evaluation of Compliance with Consensus Standards, Codes, and Regulations
Quality Assurance Audits for Nuclear Plants
Fire Hazard Evaluation and Protection of Heavy Industry
Pre-Fire Planning
Development, Presentation, and Evaluation of Fire Training Programs

SECURITY CLEARANCE

DOE "Q" Clearance

MICHAEL E. MOWRER, P.E.
VICE PRESIDENT

Professional Loss Control, Inc.

MAJOR PROJECT EXPERIENCE

1. Fire Protection System Evaluation and Design for Power Plants:

Commonwealth Edison Co.	- Dresden, Units 2 & 3, & Quad Cities, Units 1 & 2
Georgia Power Co.	- E. I. Hatch, Units 1 & 2
Jersey Central Power & Light	- Oyster Creek Nuclear Generating Station
Carolina Power & Light	- Brunswick Steam Plant, Units 1 & 2
Electricity Supply Commission of the Republic of South Africa	- nine plants
Ohio Edison	- ten plants
Washington Public Power Supply System	- Unit 1
Springfield City Utilities	- Southwest Power Plant
New Brunswick Electric Power Commission	- Pt. Lepreau, Unit 1
Long Island Lighting Company	- Shoreham Nuclear Power Station
Santee Cooper	- six plants
Indiana & Michigan Electric Co.	- D.C. Cook, Units 1 & 2

2. Audits of Nuclear Power Plants:

Florida Power Corporation	Crystal River, Unit 3
Power Authority of the State of New York (PASNY)	Indian Point, Unit 3
Power Authority of the State of New York (PASNY)	J.A. FitzPatrick Plant
Alabama Power Company	J.M. Farley, Unit 1
Georgia Power Company	E.I. Hatch, Units 1 & 2
Tennessee Valley Authority	Browns Ferry, Units 1,2, & 3
Toledo Edison	Davis-Besse Nuclear Station
Consolidated Edison	Indian Point, Unit 2
Kansas Gas and Electric	Wolf Creek
Lousiana Power and Light	Waterford 3

3. Inspections of Heavy Industry (Representative Sample):

Valspar Corporation	Rockford, Illinois
FMC Corporation	Portland, Oregon
O'Brien Paint	South Bend, Indiana and San Francisco, California
Conchemco, Inc.	Kansas City, Missouri
American Aerosols	Holland, Michigan
St. Louis Car Co.	St. Louis, Missouri
Guardsman Chemical	Grand Rapids, Michigan
Standard T. Chemical	Chicago, Illinois
Sherman Williams Co.	Cleveland, Ohio
Mallincrodt Chemical	St. Louis, Missouri
Pratt & Lambert, Inc.	Kansas City, Missouri

4. Major Municipal Fire Protection Studies:

Kansas City, Missouri
Lockport, New York
Hoffman Estates, Illinois
New Castle, Pennsylvania
Altoona, Pennsylvania
Columbia, Missouri

5. OSHA Surveys:

Goddard Space Center, Maryland
Fort Buchanan (U.S. Army), Puerto Rico
Fort Meade (U.S. Army), Maryland
New Cumberland Depot (U.S. Army), Pennsylvania
Naval Rework Facilities (6 locations), U.S.A.
General Accounting Office, Washington, D.C.
Columbus Depot (U.S. Army), Ohio
Santee Cooper, South Carolina (6 plants)

6. Fire Protection Engineering Training Seminars:

U.S. NRC, Fire Protection for Nuclear Power Plants
Southern California Edison, Fire Protection for Power Plants
Wisconsin Electric Power, Fire Protection for Power Plants
Professional Loss Control, Fire Protection for Power Plants
Rochester Gas & Electric, Fire Brigade Leadership
Professional Loss Control, Industrial Fire Brigade Leadership
Power Authority of the State of New York, Fire Brigade Leadership
Long Island Lighting Company, Fire Protection Technology
Verlan Limited, Fire Protection for Coatings Manufacturers
New Brunswick Electric Power Commission, Fire Brigade Leadership
Niagara Mohawk Power Corp., Fire Brigade Leadership
Portland General Electric, Fire Protection for Power Plants

7. Pre-Fire Emergency Planning

Zimmer Nuclear Power Station
Oyster Creek Nuclear Generating Station
Crystal River, Unit 3
Callaway Plant
Susquehanna Steam Electric Station
Wolf Creek Generating Station
Shoreham Nuclear Power Station
Point Beach Nuclear Plant

8. Fire Hazards Analysis

Georgia Power Company, E.I. Hatch, Units 1 & 2
Washington Public Power Supply System, Unit 1
Carolina Power & Light, Brunswick Steam Electric Plant, Units 1 & 2
Carolina Power & Light, H.B. Robinson, Unit 2
Northern States Power Company, Monticello Nuclear Generating Station
Commonwealth Edison Company, Dresden Nuclear Power Station, Units 2 & 3
Commonwealth Edison Company, Quad Cities Nuclear Power Station, Units 1 & 2

MICHAEL E. MOWRER, P.E.
VICE PRESIDENT

Professional Loss Control, Inc.

PAPERS AND PRESENTATIONS

1. "Fire Emergency Planning," M.E. Mowrer, presented at the WATTec Engineering Conference, Knoxville, Tennessee; February 1980.

2. "Emergency Preparedness," M.E. Mowrer, presented at AIChE Winter National Meeting in Atlanta, Georgia; on March 14, 1984.

3. "Fire Detection Design Considerations for Nuclear Power Plants," M.E. Mowrer, presented at the Second Annual Fire Engineering Conference at Manhattan College, Riverdale, New York; June 4, 1984.

PLC *Professional Loss Control, Inc.*

CHRISTOPHER A. KSOBIECH
FIRE PROTECTION ENGINEER, E.I.T.

EDUCATION

B.S. Fire Protection Engineering, Illinois Institute of Technology, 1980
Graduate Student, Engineering Science & Mechanics Department, Univ. of Tennessee

PROFESSIONAL AFFILIATIONS

Society of Fire Protection Engineers, Associate Member
National Fire Protection Association, Member
Engineer-in-Training, #061-016246, Illinois
Salamander, Honorary Fire Protection Engineering Society
National Society of Professional Engineers

PROFESSIONAL EXPERIENCE

Mr. Ksobiech has more than four years' experience in fire protection engineering. Since joining Professional Loss Control Mr. Ksobiech has been involved with the fire protection methodology pertaining to the nuclear power industry. He has performed a number of studies to evaluate the effectiveness of fire detection and suppression systems, calculated heat transfer exposure to equipment and structural elements with state-of-the-art computer fire modeling techniques, coordinated product testing of materials to obtain listings by a nationally recognized testing laboratory, and conducted audits of nuclear facilities.

He has provided on-site support for a major overseas utility for 1-1/2 years, developing their fire protection program from both a corporate and station level. This included establishing fire protection guidelines, procedures, and standards, evaluation of existing facilities and training of corporate and field personnel. Mr. Ksobiech was also involved in the development, review, and acceptance of the utility's fire protection philosophies and systems involved in their on-going construction program.

Prior to joining PLC, Mr. Ksobiech worked as a Fire Protection Engineer for a large chemical and nuclear production facility where he conducted detailed audits of the process and support facilities to confirm compliance with NFPA, OSHA, and other standards. His responsibilities included review of engineering specifications and safety analysis reports, establishing design criteria, and approving the installation of new fire suppression systems. He served as Department Representative on the plant Quality Assurance and Environmental, Safety, and Health committees.

AREAS OF SPECIALIZATION

HPR Type Inspections and Audits
Fire Hazard Analyses
Fire Detection & Suppression System Design and Evaluation
Evaluation of Compliance with Federal & OSHA Standards, NFPA, & Building Codes
Product Testing
Fire Behavior Modeling
Computer Assisted Hydraulic Analysis
Fire Protection Program and Procedure Development
Evaluation of Nuclear Power Plant Fire Protection programs for compliance with NRC (Appendix R) requirements.

SECURITY CLEARANCE

Active DOE "Q" Clearance

Title

Group Supervisor, Nuclear Licensing Section
Nuclear Safeguards and Licensing Division

Education

Kansas State University - B.S. Nuclear Engineering - 1971
University of Illinois - M.S. Nuclear Engineering - 1976

Registration

Professional Engineer - Illinois

Responsibilities

Mr. Dingler is responsible for review and coordination of nuclear licensing activities within Sargent & Lundy's scope of work for several projects. He acts as liaison with regulatory bodies, clients, vendors, and other Sargent & Lundy divisions. He analyzes and reviews designs of nuclear power plants to ensure conformance with the code of federal regulations and other design requirements. He also assembles the information necessary for a safety analysis report.

Experience

Mr. Dingler has had experience in supporting the licensing effort of several nuclear-powered steam-electric generating stations. He has performed studies and developed modifications for five operating nuclear reactors, and provided technical and licensing support for four reactors undergoing review for an operating license. He has coordinated the Marble Hill Standard Review Plan Conformance Review. Mr. Dingler has coordinated the preparation and amendment of the Final Safety Analysis Report for 985 MW capacity BWR and provided support for hearings before the Advisory Committee for Reactor Safety and the Atomic Safety and Licensing Board. He has conducted the fire protection alternate safe shutdown analysis for four operating plants and three plants under operating license review. He has assisted client personnel in performing various onsite licensing studies. Additionally, Mr. Dingler has performed radiological safety calculations in S&L's Shielding and Radiological Safety Section.

Prior to joining S&L in 1976, Mr. Dingler was a munitions maintenance officer in the U.S. Air Force for three years. He was responsible for all aspects of maintenance, storage, and safety, of nuclear and conventional weapons.

Membership

American Nuclear Society

Nuclear Power Plant Projects

Station - Unit	Rated Gross MW	Operating Date(s)	Client	Assignment	Assignment Date(s)
Byron 1,2/ Braidwood 1,2	1175 (each)	1984/1985/ 1985/1986	Commonwealth Edison Company	Performed and reviewed shielding calculations	1983 to present
La Salle 1,2	1122 (each)	1982/1984	Commonwealth Edison Company	Analyzed the effects of a fire on the ability to safe shutdown per Appendix R	1982 to present/ 1979 to 1980
Marble Hill 1,2	1175 (each)	1988/1990	Public Service Indiana	Coordinated Standard Review Plan Conformance Review. Onsite assistance in licensing studies	1982 to 1983
Clinton 1,2	985 (each)	1986/Cancelled	Illinois Power Company	Supported licensing effort directed toward obtaining operating license	1979 to 1983
Marble Hill 3&4	1175 (each)	Cancelled	Public Service Indiana	Supported licensing effort toward obtaining a construction permit. Review design criteria for incorporation of regulatory requirements	1978 to 1980
Dresden 1-3	1900 (total)	1960/1971/1971	Commonwealth Edison Company	Provided licensing support of operating reactors addressing safety issues especially the Dresden 1 ECCS modification and fire protection	1976 to 1979
Quad Cities 1,2	850 (each)	1972	Commonwealth Edison Company	Provided licensing support of operating reactors addressing safety issues	1976 to 1979

Title

Mechanical Project Engineer

Education

DePaul University - M.B.A. - 1979
University of Illinois, Champaign-Urbana - B.S.M.E. - 1975

Registration

Professional Engineer - Illinois

Responsibilities

As a mechanical project engineer, Mr. Nosko coordinates the efforts of the engineering and support specialists within the mechanical disciplines. He directly oversees and directs the work of the mechanical engineers assigned to his projects. The mechanical project engineer is responsible for the conformance of mechanical project work to applicable Sargent & Lundy standards and procedures. This includes performing preliminary design studies to determine general plant layout and sizing, specifying equipment, analysis of economic factors, preparing flow diagrams, and sizing of piping including analysis of flexibility and support systems. He maintains client contact and incorporates operating philosophies within design parameters, interfaces with suppliers in selecting equipment, materials, and labor packages, evaluates proposals, and recommends purchases.

Experience

Mr. Nosko has experience in the mechanical design, engineering and analysis of nuclear- and fossil-fueled steam-electric generating stations. This includes preparing design criteria and process flow diagrams; preparing and evaluating piping, equipment and construction specifications; and directing support personnel in project activities. He has worked on several plant betterment projects with responsibility for project scope of work and schedule development, monitoring, and directing project progress. He was also the engineer responsible for coordinating and controlling efforts of all design and drafting personnel involved with analysis and design of piping supports on a nuclear power plant consisting of two 1122-MW units.

Mr. Nosko previously worked as an engineering analyst in Sargent & Lundy's Mechanical Analytical Division. In this capacity, he conducted detailed mechanical engineering design studies on various power plant systems and equipment. He joined Sargent & Lundy in 1975.

Before joining Sargent & Lundy, Mr. Nosko worked briefly for another architect/engineer as a field service engineer.

Power Plant Design Projects

Station - Unit	Fuel	Rated Gross MW	Operating Date(s)	Client	Assignment	Assignment Date(s)
La Salle 1,2	Nuclear	1122 (each)	1982/1984	Commonwealth Edison Company	Mechanical Project Engineer/Mechanical Engineer	10-80 to 1-83
Edgewater 5	Coal	380	1985	Wisconsin Power & Light Company	Mechanical Engineer	7-79 to 10-80
Carroll County 1,2	Nuclear	1175 (each)	Deferred	Commonwealth Edison Company	Mechanical Engineer	10-77 to 7-79
Marble Hill 1,2	Nuclear	1175 (each)	Suspended	Public Service Indiana	Mechanical Engineer	9-76 to 10-77

Power Plant Betterment Projects

Station - Unit	Fuel	Rated Gross MW	Client	Assignment	Assignment Date(s)
Dresden 2,3	Nuclear	850 (each)	Commonwealth Edison Company	Mechanical Project Engineer	1-83 to present
Quad Cities 1,2	Nuclear	850 (each)	Commonwealth Edison Company	Mechanical Project Engineer	1-83 to present
E.W Brown 1-3	Coal	701 (total)	Kentucky Utilities Company	Mechanical Engineer (flue gas monitoring equipment backfit)	1-80 to 1-81
Ghent 1,2	Coal	511 (each)	Kentucky Utilities Company	Mechanical Engineer (flue gas monitoring equipment backfit)	1-80 to 1-81
Green River 3	Coal	66	Kentucky Utilities Company	Mechanical Engineer (flue gas monitoring equipment backfit)	1-80 to 1-81
Tyrone 3	Coal	66	Kentucky Utilities Company	Mechanical Engineer (flue gas monitoring equipment backfit)	1-80 to 1-81
Edgewater 3,4	Coal	399 (total)	Wisconsin Power & Light Company	Mechanical Engineer (ductwork and common chimney backfit)	7-79 to 10-80

970,452
021784

Title	Electrical Engineer
Education	Purdue University - B.S.E. - 1973
Registrations	Professional Engineer: Illinois Indiana
Responsibilities	Mr. Ruth currently is responsible for participating in the design of electrical circuitry to support power plant betterment projects at operating nuclear generating stations.
Experience	Mr. Ruth has done the engineering design of the electrical controls and power distribution systems for both nuclear- and fossil-fueled generating stations. His nuclear assignments have included the design and specification of electrical controls and the coordination of field design and construction with office engineering and design activities, including the resolution of a wide variety of electrical construction problems. He also has engineered the design of HVAC controls and distribution systems, cathodic protection systems, and coal conveyor controls and distributions systems for several fossil-fired stations. Mr. Ruth joined Sargent & Lundy in 1974.
Memberships	Institute of Electrical and Electronics Engineers Power Engineering Society

Power Plant Design Projects

Station - Unit	Fuel	Rated Gross MW	Operating Date(s)	Client	Assignment	Assignment Date(s)
Marble Hill 1,2	Nuclear	1175 (each)	Suspended	Public Service Indiana	Office and field coordination, remote multiplexing system design, and resolution of field problems	4-82 to 1-84
Baton Rouge Cogeneration Plant (4 units)	Coal, Oil, Slurry Coal & Pyrolysis Char	370 (each)	Deferred	Exxon Company, U.S.A.	Coal handling system controls and distribution	9-81 to 4-82
Dolet Hills 1	Lignite	707	1986	Southwestern Electric Power Company/Central Louisiana Electric Company, Inc.	HVAC controls and distribution design and specifications	6-80 to 4-82
Henry W. Pirkey 1	Lignite	707	1985	Southwestern Electric Power Company	HVAC controls and distribution design and specifications	7-79 to 4-82
Edgewater 5	Coal	380	1985	Wisconsin Power and Light Company	HVAC controls and distribution design and specifications	1-79 to 12-81
Schahfer 17,18	Coal & Oil	393 (each)	1983/1986	Northern Indiana Public Service Company	HVAC controls and distribution design and specifications	5-79 to 9-81
Pleasant Prairie 2	Coal	570	1985	Wisconsin Electric Power Company	HVAC controls and distribution design and specifications	7-79 to 10-80
Weston 3	Coal	321	1981	Wisconsin Public Service Corp.	HVAC controls and distribution design and specifications	7-77 to 10-80
Ghent 3,4	Coal	511 (each)	1981/1984	Kentucky Utilities Company	HVAC controls and distribution design and specifications	7-77 to 10-80
Lawton Tire 1,2	Coal & Oil	N.A.	1979	The Goodyear Tire & Rubber Co.	Coal handling system and HVAC system controls and distribution design and specifications	10-77 to 3-79
East Bend 2	Coal	648	1981	The Cincinnati Gas & Electric Company	Moto control centers, batteries, and precipitators	5-76 to 2-77

Power Plant Design Projects, Continued

Station - Unit	Fuel	Rated Gross MW	Operating Date(s)	Client	Assignment	Assignment Date(s)
Gibson 3,4	Coal	618 (each)	1978/1979	Public Service Indiana	Specifications for transformers, bus duct, motor control center, batteries, uninterruptible power supplies, electrostatic precipitators, control cable, power cable, and cable tray	7-74 to 5-76

Power Plant Betterment Projects

Station - Unit	Fuel	Rated Gross MW	Client	Assignment	Assignment Date(s)
Zion 1,2	Nuclear	1085 (each)	Commonwealth Edison Company	Modification of main steam isolation valves control circuitry to adapt to new environmentally qualified hydraulic prevent resetting of valves during safety injection	1-84 to 2-84
Powerton 5	Coal	828	Commonwealth Edison Company	Design and specification of HVAC controls and distribution equipment for FGDS addition	3-77 to 7-78
Beckjord 1-6	Coal	1171 (total)	The Cincinnati Gas & Electric Company	Procurement and design coordination for cathodic protection	9-76 to 3-77
Dicks Creek	Coal	N.A.	The Cincinnati Gas & Electric Company	Procurement and design coordination for cathodic protection	9-76 to 3-77

DRESDEN 2&3

ENCLOSURE II

INTERIM COMPENSATORY MEASURES

DRESDEN UNITS 2&3

INTERIM COMPENSATORY MEASURES

The scheduler requirements for Appendix R modifications are outlined in 10 CFR 50.48. The NRC has requested that nuclear stations petitioning for relief from the scheduler requirements of 10 CFR 50.48 show, through interim measures, that safe shutdown can be achieved. These interim measures should be implemented until the modifications, which do not meet the requirements of 10 CFR 50.48, are completed. In the B. Rybak letter to H. R. Denton dated May 18, 1984, Dresden Station petitioned for relief from the scheduler requirements of 10 CFR 50.48 for the modifications in the 1982 Dresden Units 2&3 Associated Circuits Analysis.

Table 1 provides a list of the previously identified modifications and their current completion schedule. This schedule supercedes the one transmitted in the B. Rybak letter to H. R. Denton. The only difference between the schedules is due to changes in the scheduled refueling outages for both units. The reanalysis to ensure conformance with Appendix R has identified several modifications in addition to those identified in the 1982 Associated Circuits Analysis (see Table 2). A schedule has not been completed for these additional modifications but they will be completed before the Fall 1986 outage for Dresden Unit 2. The only exception to this is the sealing of penetrations in fire barriers. This task will be completed by October 15, 1984.

Table 2 lists the interim measures or justifications for continued operation for all modification, additional and previously identified, which will not be completed within the 10 CFR 50.48 schedule. In view of the fact that a schedule has not been developed for the additional modifications, interim measures or justifications for continued operation have been proposed for all of these modifications. The interim measures will ensure that safe shutdown can be achieved for both units in the event of a fire. The proposed interim measures will only be implemented until the corresponding modifications are completed. In addition, Dresden Station has a safe shutdown procedure to ensure the ability to safely shut down both units in the event of a fire in the control room or auxiliary electric equipment room.

The F-Drawings for Dresden Units 2&3 have been included with this submittal. These are general arrangement drawings which show safe shutdown equipment and power and control cables, fire zone boundaries, and existing detection and suppression systems.

Dresden Station Units 2&3 has been separated into four major fire areas to facilitate the Appendix R reverification. This includes the Unit 2 and Unit 3 Reactor Buildings, the Turbine Building, and the Crib House. General area descriptions of these areas are included in Enclosure III, Sections 3.1, 4.1, 5.1, and 6.1,

respectively. These descriptions represent the plant configuration after completion of all Appendix R modifications. A description of the safe shutdown methods employed at Dresden Station is in Enclosure III, Section 2.0.

The interim measures or justifications for continued operation outlined in Table 2 are based, for the most part, on the following:

- The majority of fire zones containing safe shutdown equipment have relatively low fire loadings and the combustibles are uniformly distributed.
- Major combustible concentrations have been protected with automatic suppression systems.
- Electrical penetrations are sealed at the barriers separating zones.
- Fire stops are provided between electrical divisions to impede the spread of a fire within fire zones.
- Local fire detection has been provided over major electrical equipment (i.e., 4-kV switchgear and 480-V MCC's).
- Products of combustibles will not affect the ability to safely shut down the plant.

As noted in Enclosure I of the Dresden 2&3 exemption request transmittal, an emergency lighting evaluation is underway at Dresden Station. This evaluation will identify additional emergency lighting necessary to perform safe shutdown functions. In the interim, until completion of this evaluation and until the additional emergency lights have been installed, portable battery operated lights will be available to the operators.

The interim measures or justifications for continued operation described herein will ensure that Dresden Station can be safely shut down in the event of a fire in any fire zone. The interim measures will only be implemented until the additional and previously identified modifications are completed.

TABLE 1

DRESDEN STATION - UNITS 2&3

APPENDIX R FIRE PROTECTION MODIFICATIONS

COMMITMENTS STATUS SUMMARY

MODIFICATION DESCRIPTION	COMMITMENT DATE	CURRENT STATUS
Fire Doors	4-1-84	Complete.
Alternate Feed to Inboard Isolation Condenser Valves	Fall Outage 1986 (Unit 2)	On schedule.
	Fall Outage 1985 (Unit 3)	On schedule.
Access to Outboard Isolation Condenser Valves	Fall Outage 1986 (Unit 2)	Ahead of schedule (completion during Fall 1984 outage)
	Fall Outage 1985 (Unit 3)	Complete.
CRD Header Crosstie	Fall Outage 1984 (Unit 2)	Complete.
	Fall Outage 1983 (Unit 3)	Complete.
Service Water Pump Local Control and Isolation	2-1-84	Complete.
DG 2/3 Modifications	Fall Outage 1985 (Unit 3) All modifications to be completed.	On schedule.
Additional Fire Detection and Water Suppression	1-1-85	On schedule.
Auxiliary Cooling Water Supply to the CRD Pumps	Fall Outage 1984 (Unit 2)	On schedule.
	Fall Outage 1985 (Unit 3)	On schedule.

TABLE 1

APPENDIX R FIRE PROTECTION MODIFICATIONS

COMMITMENTS STATUS SUMMARY (Cont'd)

MODIFICATION DESCRIPTION	COMMITMENT DATE	CURRENT STATUS
DG 3 Fuel Oil Transfer Pump Local Control and Isolation	Fall Outage 1983 (Unit 3)	Complete.
Local Reactor Pressure Indication	Fall Outage 1984 (Unit 2)	On schedule.
	Fall Outage 1983 (Unit 3)	Complete.

TABLE 2

DRESDEN 2&3

INTERIM COMPENSATORY MEASURES

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2 Reactor Building		
Torus Basement Elev. 476'-6" (1.1.2.1)	1. Provide linear thermal detection along cable trays due to the use of an alternate shutdown method indpendent of this area.	In general, this zone has very low combustible loading (600 Btu/ft^2). The primary source of combustibles are the contents of the cable trays. Further, there is wide separation and substantial barriers between the alternate safe shutdown path and this zone. Therefore, no interim measure is warranted.
	2. Provide 1-hour protection for the alternate power source to Inboard Isolation Condenser Valves cabling routed through this zone.	See Item 3 Elev. 517 feet 6 inches Fire Zone 1.1.2.2.
Ground floor Elev. 517'-6" (1.3.2)	1. Provide fire detection throughout Shutdown Cooling Pump room (Area 1.3.2) due to the use of an alternate shutdown method independent of this area.	In general, this area has a low combustible loading (25,000 Btu/ft^2) The HPCI/LPCI alternate shutdown path is independent of this area. Therefore, no interim measure is warranted.
	2. Seal all penetrations to the Shutdown Cooling Pump room (1.3.2) to a 3-hour rating (except for the louver to the steam chase) to provide a 3-hour barrier between alternate shutdown methods.	This area contains isolation condenser safe shutdown electrical cabling. The Class A fire door is in place and the cable penetrations are sealed. The HPCI/LPCI alternate shutdown path is independent of this area. It is very unlikely for fire to spread through the mechanical openings to the HPCI/LPCI cables in Fire Zone 1.1.2.2. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2 Reactor Building (Cont'd)		
Ground floor Elev. 517'-6" (1.1.2.2)	1. Provide detection throughout fire zone due to the use of an alternate shutdown method independent of this area.	In general, this zone has low combustible loading (30,000 Btu/ft^2). There is currently local detection over the safety-related MCC's which form a semi-circle around the drywell. Therefore, no interim measures are warranted.
	2. Install a Class A fire door on the access to the 2/3 diesel generator to provide a 3-hour barrier between alternate shutdown methods.	Currently, there are two nonlabeled substantial doors in series to provide secondary containment. There is also detection and suppression in the 2/3 diesel generator room. Therefore, no interim measure is warranted.
	3. Provide an alternate power feed to the inboard isolation condenser valves (Previously identified in the 1982 Associated Circuits Analysis) Outage mod. This modification will allow reopening of a spuriously closed inboard isolation condenser valve.	Currently, there is a procedure to re-open the normally open valves if either or both valves were to spuriously close due to a fire induced fault. This procedure requires lifting leads and installing a jumper for each valve (hot shutdown repair). There is early-warning detection over the MCC that powers the valves. This modification is for spurious operation of the inboard valves. Due to the unlikelihood of fire induced faults, interim measures are not warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2 Reactor Building (Cont'd)		
Mezzanine floor Elev. 545'-6" (1.1.2.3, 1.1.2.5.C)	1. Provide fire detection throughout Zone 1.1.2.3 due to the use of an alternate shutdown method independent of this area.	In general, this zone has low combustible loading (25,500 Btu/ft^2). Currently, there is local detection over the 4160 volt switchgear which is the major hazard in this zone and is adjacent to the isolation condenser pipe chase. Therefore, no interim measure is warranted.
	2. Seal all penetrations to the isolation condenser pipe chase (1.1.2.5.C) to provide a 3-hour barrier between alternate shutdown methods.	This modification is proposed to protect operating personnel during manual operation in the pipe chase. The pipe chase is adjacent to the local detection installed on this floor. A 3-hour labeled door has been installed. Negligible combustibles are present in the pipe chase. Only mechanical penetrations are unsealed. Therefore, no interim measure is warranted.
	3. Reroute pressure and level instrumentation cables to ensure availability of reactor pressure and level indication in the control room for a fire below this elevation.	For a fire in Fire Zone 1.1.2.3, local pressure and level gauges exist on the elevation below, on opposite sides of the drywell, in Fire Zone 1.1.2.2. In the interim, local pressure and level gauges on the 545'-6" elevation will be used for a fire in Fire Zone 1.1.2.2.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2 Reactor Building (Cont'd)		
Main floor Elev. 570'-0" (1.1.2.4, 1.1.2.5.B)	1. Provide detection throughout Zone 1.1.2.4 due to the use of an alternate shutdown method independent of this area.	In general, this zone has low combustible loading (8200 Btu/ft^2). There is local detection over the MCC's and switchgear which are adjacent to the isolation condenser pipe chase and the equipment hatchway. This detection provides early warning of a fire in this zone. Therefore, no interim measure is warranted.
	2. Seal all penetrations to the isolation condenser pipechase (1.1.2.5.B) to provide a 3-hour barrier between alternate shutdown methods.	The detection on this floor is adjacent to the pipechase. A 3-hour labeled door is in place. Only mechanical penetrations are unsealed. There are negligible combustibles in the pipe chase. Therefore, no interim measure is warranted.
	3. Seal all penetrations to the isolation condenser floor Elev. 589'-0" (1.1.2.5.A) except the hatchway and stairs to provide a 3-hour barrier between alternate shutdown methods.	The detection in the zone is over the major electrical equipment. The combustible loading is light on both elevations. The cable penetrations have been sealed. The unsealed penetrations consist of conduits and pipes. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2 Reactor Building (Cont'd)		
	4. Provide automatic water suppression around the hatchway, stairs, and ladder opening at the ceiling level to provide an equivalent 3-hour barrier between alternate shutdown methods.	The hatchway and stairs are adjacent to the local detection. There is no continuity of combustibles through the openings. There is currently an unrated hatch cover over the ladder opening. There is no continuity of combustibles through the openings. There are light combustibles on both elevations. Therefore, no interim measure is warranted.
	5. Provide 3-hour fire damper in HVAC duct to Turbine Building (Col. 40/H) to provide a 3-hour barrier between the reactor building and the turbine building.	There is no safe shutdown equipment or cabling in the vicinity on either side of the barrier. The duct does have substantial, unrated, butterfly dampers. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2 Reactor Building (Cont'd)		
Isolation Condenser floor Elev. 589'-0" (1.1.2.5.A, 1.1.2.5.D)	1. Provide fire detection throughout Fire Zone 1.1.2.5.A due to the use of an alternate shutdown method independent of this area.	In general, this zone has very low combustible loading (1200 Btu/ft^2). There is presently partial detection on the floor below (Fire Zone 1.1.2.4). To affect the alternate shutdown path, a fire would have to propagate down with no continuity of combustibles. Therefore, no interim measure is warranted.
	2. Provide automatic water suppression at the ceiling around the hatchway and stairs to provide an equivalent 3-hour barrier between alternate shutdown methods.	The adjacent zones (1.1.1.6/1.1.2.6) have very low combustible loading (300 Btu/ft^2). There is no safe shutdown equipment or cabling in Zones 1.1.1.6/1.1.2.6 above. Therefore, no interim measure is warranted.
	3. Provide 3-hour protection for the door way to the Standby Liquid Control Zone 1.1.2.5.D to provide a 3-hour barrier between alternate shutdown methods.	There is no continuity of combustibles through this opening. The combustible loading of Fire Zone 1.1.2.5.D is 800 Btu/ft^2. No safe shutdown equipment or cabling is in Fire Zone 1.1.2.5.D. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2 Reactor Building (Cont'd)		
	4. Provide access ladder to the isolation condenser pipe chase Elev. 570'-0". (1.1.2.5.B) for manual operation of outboard isolation condenser valves.	There are other access methods available. This ladder will only facilitate access for manually operating the valves in the isolation condenser pipe chase. There are fire doors for access to the isolation condenser pipe chase at Elevations 570'-0" and 545'-6". Therefore, no interim measures are warranted.
	5. Provide a 3-hour fire damper in HVAC duct penetration to turbine building (Fire Zone 1.1.2.5.D) to provide a 3-hour barrier between the reactor building and turbine building.	There is no safe shutdown equipment or cabling in the vicinity on either side of this penetration. Currently, the duct has substantial nonrated butterfly dampers. Therefore, no interim measure is warranted.
	6. Provide a 3-hour damper in the HVAC duct of 43.5/N at floor level to provide a 3-hour barrier between alternate shutdown methods.	Combustible loading is light on both elevations. Therefore, no interim measure is warranted.
	7. Provide a 3-hour damper in the HVAC duct at 38.3/L to provide a 3-hour barrier between alternate shutdown methods.	Negligible combustible loading in both zones. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2 Reactor Building (Cont'd)		
Southeast Corner Room Elev. 476'-6" (11.2.2)	1. Provide detection throughout zone due to the use of an alternate shutdown method independent of this area.	In general, this zone has low combustible loading (17,700 Btu/ft^2). This zone is also widely separated from the alternate safe shutdown path. Therefore, no interim measure is warranted.
Southwest Corner Room Elev. 476'-6" (11.2.1)	1. Provide detection throughout zone due to the use of an alternate shutdown method independent of this area.	In general, there is low combustible loading in this zone (26,800 Btu/ft^2). This zone is also widely separated from the alternate safe shutdown path. Therefore, no interim measure is warranted.
HPCI Room Elev. 476'-6" (11.2.3)	1. Seal the penetrations to this area from the Unit 2 reactor building to provide a 3-hour barrier between this area and the Unit 2 reactor building.	This zone has suppression and detection throughout. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 3 Reactor Building		
Torus Basement Elev. 476'-6" (1.1.1.1)	1. Provide linear thermal detection along cable trays due to the use of an alternate shutdown method independent of this area.	In general, this zone has very low combustible loading (1200 Btu/ft^2). The primary source of combustibles are the contents of the cable trays. Further, there is wide separation and substantial barriers between the alternate safe shutdown path and this zone. Therefore, no interim measure is warranted. This modification is to be installed for the following modification.
	2. Provide 1-hour protection for the alternate power source to the inboard isolation conser valves cabling routed through this zone.	See modification 6 for Fire Zone 1.1.1.2.
Ground floor Elev. 517'-6" (1.4.1)	1. Provide detection throughout area 1.4.1 due to the use of an alternate shutdown method independent of this area.	In general, this area has low combustible loading (7,100 Btu/ft^2). The HPCI/LPCI alternate shutdown path is independent of this area. Therefore, no interim measure is warranted.
	2. Seal all penetrations to the TIP room (1.4.1) to a 3-hour rating to provide a 3-hour barrier between alternate shutdown methods.	This area contains isolation condenser safe shutdown electrical cabling. The Class A fire door is in place and the cable penetrations are sealed. The HPCI/LPCI alternate shutdown path is independent of this area. It is very unlikely for fire to spread through the mechanical openings to the HPCI/LPCI cables. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 3 Reactor Building (Cont'd)		
Ground Floor Elev. 517'-6" (1.1.1.2)	1. Provide detection throughout zone due to the use of an alternate shutdown method independent of this area.	In general this zone has low combustible loading (32,300 Btu/ft^2). There is currently local detection over the safety-related MCC's which form a semicircle around the drywell. Therefore, no interim measure is warranted.
	2. Seal openings to Unit 2 Reactor Building to a 3-hour rating to provide a 3-hour barrier between reactor buildings.	This 3-hour labeled door is installed. The cable penetrations are sealed. The remaining openings are few and small consisting of conduits and pipes. There is local detection on both sides of the common wall. The combustible loading on either side of the common wall is low. Therefore, no interim measure is warranted.
	3. Reroute and 1-hour fire-wrap the Unit 2 power and control cables for the 2/3 diesel generator and auxiliaries (Previously identified in 1982 Associated Circuits Analysis) OUTAGE MOD. This modification will provide equivalent Appendix R separation from redundant cables.	A procedure exists that utilizes mechanical cross ties and Unit 2 equipment powered from the Unit 2 diesel generator to shutdown Unit 3. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 3 Reactor Building (Cont'd)		
	4. One-hour fire-wrap the 2/3 diesel generator bus duct feeding Unit 2 to provide equivalent Appendix R separation for the Unit 2 and Unit 3 4-kV power feeds.	A procedure exists that utilizes mechanical cross ties and Unit 2 equipment powered from the Unit 2 diesel generator to shutdown Unit 3. Therefore, no interim measure is warranted.
	5. Provide an alternate power feed to the inboard isolation condenser valves (Previously identified in 1982 Associated Circuits Report) OUTAGE MOD. This will enable reopening of a spuriously closed normally open inboard isolation condenser valve.	Currently, there is a procedure to re-open the normally open valves if either or both valves were to spuriously close due to a fire induced fault. This procedure requires lifting leads and installing jumpers (hot shutdown repair). There is early-warning detection over the MCC that powers the valves. This modification is for spuriously operation of the inboard valves. With the unlikelyhood of fire induced faults, interim measures are not warranted.
Mezzanine floor Elev. 545'-6" (1.1.1.3, 1.1.1.5.C)	1. Provide detection throughout Zone 1.1.1.3 due to the use of an alternate shutdown method independent of this area.	In general, this zone has low combustible loading (22,800 Btu/ft^2). There is local detection over the 4160 volt switchgear which is the major hazard in this zone and adjacent to the isolation condenser pipe chase. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 3 Reactor Building (Cont'd)		
	2. Seal all penetrations to the isolation condenser pipe chase (1.1.1.5.C) to provide a 3-hour barrier between alternate shutdown methods.	This modification is proposed to protect operating personnel during manual operations in the pipe chase. The local detection is adjacent to the pipe chase. The 3-hour labeled door has been installed. Negligible combustibles are present in the pipe chase. Only mechanical penetrations are unsealed. Therefore, no interim measure is warranted.
	3. Seal all penetrations to Unit 2 Reactor Building (Zone 1.1.2.3) to provide a 3-hour barrier between reactor buildings.	The 3-hour labeled door is installed. The cable penetrations are sealed. The unsealed penetrations are few and small and consist of conduits and piping. The combustible loading on either side of the wall is light. Therefore, no interim measure is warranted.
	4. Reroute pressure and level cables to ensure availability of reactor pressure and level indication in the control room for a fire below this elevation.	For a fire in Fire Zone 1.1.1.3, local pressure and level gauges exist on the elevation below, on opposite sides of the drywell, in Zone 1.1.1.2. In the interim, local pressure and level gauges on the 545'-6" elevation will be used for a fire in Zone 1.1.1.2.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 3 Reactor Building (Cont'd)		
Main floor Elev. 570'-0" (1.1.1.4, 1.1.1.5.B)	1. Provide detection throughout Zone 1.1.1.4 due to the use of an alternate shutdown method independent of this area.	In general, this zone has low combustible loading (10,600 Btu/ft^2). There is local detection at the ceiling over the MCC's and switchgear adjacent to the pipe chase and hatch. This detection provides early-warning of a fire that may threaten the separation of the two shutdown paths. Therefore, no interim measure is warranted.
	2. Seal all penetrations to the isolation condenser pipe chase (1.1.1.5.B) to provide a 3-hour barrier between alternate shutdown methods.	The current detection is adjacent to the pipe chase. A 3-hour labeled door is installed. The major pipe penetrations have been sealed. Only minor unsealed mechanical penetrations remain. There are negligible combustibles in the pipe chase. Therefore, no interim measure is warranted.
	3. Seal all penetrations to the isolation condenser floor Elev. 589'-0" (1.1.1.5.A) except the hatchway and ladder to provide a 3-hour barrier between alternate shutdown paths.	Fire detection provided in the zone is over the major electrical equipment. The combustible loading is light on both elevations. The cable penetrations have been sealed. The remaining penetrations are conduits and pipes. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 3 Reactor Building (Cont'd)		
	4. Provide automatic water suppression around the hatchway and ladder opening at the ceiling to provide an equivalent 3-hour barrier between alternate shutdown paths.	The present detection is adjacent to the hatchway. There is currently an unrated covered hatch on the ladder opening. There is no continuity of combustibles through the openings. There are light combustibles on both elevations. Therefore, no interim measure is warranted.
	5. Provide 3-hour fire damper in HVAC duct to Turbine Building (Col. 47/H) to provide a 3-hour barrier between the reactor building and turbine building.	There is no safe shutdown equipment or cabling in the vicinity on either side of the barrier. Currently, there are substantial non-rated butterfly dampers in the duct. Therefore, no interim measure is warranted.
Isolation Condenser floor Elev. 589'-0" (1.1.1.5.A, 1.1.1.5.D)	1. Provide detection throughout Zone 1.1.1.5.A due to the use of an alternate shutdown method independent of this area.	In general, this zone has low combustible loading (1000 Btu/ft^2). Currently, there is partial detection on the floor below (Zone 1.1.1.4). To affect the alternate shutdown path, a fire would have to propagate down with no continuity of combustibles. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 3 Reactor Building (Cont'd)		
	2. Provide automatic suppression for the hatchway at the ceiling level to provide an equivalent 3-hour barrier between alternate shutdown methods.	There is no safe shutdown equipment or cabling on the floor above. The combustible loading on that floor is 300 Btu/ft^2. Therefore, no interim measure is warranted.
	3. Provide 3-hour protection for the doorway to the Standby Liquid Control Zone 1.1.1.5.D to provide a 3-hour barrier between alternate shutdown methods.	There is no continuity of combustibles through the opening. The combustible loading of Zone 1.1.1.5.D is 900 Btu/ft^2. No safe shutdown equipment or cabling is in Zone 1.1.1.5.D. Therefore, no interim measure is warranted.
	4. Install a 3-hour damper in HVAC duct at 50/M at the floor to provide a 3-hour barrier between alternate shutdown methods.	Combustible loading is light on both elevations. Therefore, no interim measure is warranted.
	5. Provide a 3-hour damper in HVAC duct penetration to Turbine Building at 44/H to provide a 3-hour barrier between the reactor building and turbine building.	There is no safe shutdown equipment or cabling in the vicinity on either side of the penetration. Currently, there is a substantial non-rated butterfly damper in the duct. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 3 Reactor Building (Cont'd)		
	6. Provide access ladder to the isolation condenser pipe chase Elev. 570'-0" (1.1.1.5.B) for manual operation of outboard isolation condenser valves.	There are other access methods available. This ladder will only facilitate access for manually operating the valves in the isolation condenser pipe chase. There are fire doors for access to the isolation condenser pipe chase at Elev. 570'-0" and 545'-6". Therefore, no interim measures are warranted.
Southwest Corner Room Elev. 476'-6" (11.1.1)	1. Provide detection throughout zone due to the use of an alternate shutdown method independent of this area.	In general, this zone has low combustible loading (21,700 Btu/ft^2). This zone is widely separated from the alternate safe shutdown path. Therefore, no interim measure is warranted.
Southeast Corner Room Elev. 476'-6" (11.1.2)	1. Provide detection throughout zone due to the use of an alternate shutdown method independent of this area.	In general, this zone has low combustible loading (18,800 Btu/ft^2). This zone is widely separated from the alternate safe shutdown path. Therefore, no interim measure is warranted.
	2. Seal all penetrations to the Unit 2 HPCI room (11.2.3) to provide a 3-hour barrier between this area and the Unit 2 HPCI room.	There is currently area-wide suppression and detection in the HPCI room. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 3 Reactor Building (Cont'd)		
	3. Seal all penetrations to the Unit 3 HPCI room (11.1.3) to provide a 3-hour barrier between alternate shutdown methods.	There is currently area-wide supression and detection in the HPCI room. Therefore, no interim measure is warranted.
	4. Provide a 3-hour labeled door in the entrance to the Unit 3 HPCI room (11.1.3) to provide a 3-hour barrier between alternate shutdown methods.	There is currently area-wide suppression and detection in the HPCI room. Therefore, no interim measure is warranted.
Dresden 2&3 Turbine Building		
Ground floor Elev. 517'-6" (8.2.5.C, 8.2.5.E)	1. Provide detection and suppression from 43-46.5/F-H and down corridors to 40 to the east and 48 to the west to separate fire zone groups and to contribute to Appendix R separation of cables required for safe shutdown. (See modification 2 for this area.	This is a common access zone which has station personnel and guards passing through this zone frequently.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2&3 Turbine Building (Cont'd)		
	2. Provide a one-hour fire resistive enclosure of cable trays from 45/H to 48/G to supplement the separation of the ground floor west turbine building zone (8.2.5.E) to complete Appendix R separation for cables required for safe shutdown.	All personnel on site are trained to call the emergency number at the first sign of fire. Suppression is provided over the major hazards in the zone. Therefore, no interim measure is warranted.
Mezzanine floor Elev. 534'-0" & 538'-0" (8.2.6.A, 8.2.6.C, & 8.2.6.E)	1. Complete detection/suppression in east zone (8.2.6.A) by providing detection from 34-36 along column/row G due to the use of an alternate shutdown method independent of this area.	There is currently local detection in this zone with suppression over the cable trays in the south portion of this zone and deluge protection over the major fire hazard. The main access to the control room is across the hatchway from this zone. Therefore, no interim measure is warranted.
	2. Add fire detection in the southern portion of the common mezzanine zone (8.2.6.C). (Previously identiifed in 1982 Associated Curcuits Report) due to the use of an alternate shutdown method independent of this area.	There is currently suppression provided throughout this zone and deluge protection provided over the major fire hazards. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2&3 Turbine Building (Cont'd)		
	3. Supplement detection west zone (8.2.6.E) due to the use of an alternate shutdown method independent of this area.	There is currently local fire detection provided in this zone with deluge protection over the major hazard. Therefore, no interim measure is warranted.
	4. Relocate local control station for MCC 38-1 main feed (which powers the 2/3 Diesel Generator Auxiliaries) to the Diesel Generator room. This modification ensures the availability of one redundant source of power to the DG 2/3 auxiliaries.	There is currently suppression throughout this zone. The control station for the redundant MCC 28-1 main feed is located on the elevation below. Therefore, no interim measure is warranted.
Unit 2 CRD Pump floor Elev. 495'-0" (8.2.2A)	1. Supply secondary CRD Pump cooling water. (Previously identified in 1982 Associated Circuits Report)	See Appendix A for Dresden Units 2&3 discussion of offsite power reliability. CRD cooling water would only be affected by loss of offsite power.
Unit 3 CRD Pump floor Elev. 495'-0" (8.2.2B)	1. Supply secondary CRD Pump cooling water. (Previously identified in 1982 Associated Circuits Report).	See Appendix A for Dresden Units 2&3 discussion of offsite power reliability. CRD cooling water would only be affected by loss of offsite power.
	2. Provide suppression throughout zone due to the use of an alternate shutdown method independent of this area.	CRD Pump crosstie is available so that Unit 2 pump could be used for a fire in this zone. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2&3 Turbine Building (Cont'd)		
Auxiliary Electric Equipment room Elev. 517'-6" (6.2)	1. Seal all penetrations to this area to provide 3-hour barrier separation between alternate shut-down methods.	The penetrations are conduits and piping. This area has full detection and suppression. Therefore, no interim measure is warranted.
Control room Elev. 534'-0" (2.0)	1. Seal all penetrations to this area to provide a 3-hour barrier between alternate shutdown methods.	This area has full area-wide detection and is constantly manned. Therefore, no further interim measures are warranted.
2/3 (Swing) Diesel Generator Room (9.0.C)	1. Electrically isolate the DG 2/3 and auxiliaries (Prevously identified in 1982 Associated Circuits Report). OUTAGE MOD. This modification will protect one unit's power and control cables from potential faults on the other unit's cables.	Mechanical cross-ties exist so that Unit 2 can be shut down using Unit 3 equipment and Unit 3 power. In addition, Unit 3 can be shut down using Unit 2 equipment and Unit 2 power. A procedure exists for shut-down using these methods. Therefore, no interim measure is warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2&3 Turbine Building (Cont'd)		
	2. Bifurcate the 2/3 Diesel Generator bus duct within the Diesel Generator room and provide breaker isolation for each branch. (Previously identified in 1982 Associated Circuits Report) OUTAGE MOD. This modification will protect one unit's 4-kV feed from potential faults on the other unit's feed.	Mechanical cross-ties exist so that Unit 2 can be shut down using Unit 3 equipment and Unit 3 power. In addition, Unit 3 can be shut down using Unit 2 equipment and Unit 2 power. A procedure exists for shutdown using these methods. Therefore, no interim measure is warranted.
Cribhouse (11.3)	1. Install transfer switch in one-hour barrier for 2/3 Diesel Generator Cooling Water Pump to ensure availability of at least one redundant power feed.	See Appendix A for Dresden Units 2&3 discussion of offsite power reliability. The combustible loading in the cribhouse is low. The major combustibles are contained in equipment. Therefore, no interim measures are warranted.
	2. Provide ceiling level suppression in lower elevation (Previously identified in 1982 Associated Circuits Report) to provide equivalent Appendix R separation for redundant service water pump cables.	The outer service water pumps and associated cables are separated by more than 100 feet in the lower elevations. Only one service water pump is needed to support hot shutdown of both units. The cable trays that contain these Unit 2 and Unit 3 power and control cables for the service water pumps, are shown in Figure F-18-2.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2&3 Turbine Building (Cont'd)		
		There are continuous intervening combustibles between these cables. A full time fire watch is being maintained until such time as fire stops can be installed in these intervening cable trays. In addition the four hatches to the upper elevation provide passage for products of combustibles. Therefore, it is unlikely for fire to spread from one unit's service water pump cables to the other unit's cables. This zone has low combustible loading. The major combustibles are contained in individual equipment. The cribhouse has station personnel performing surveillances at least once per shift. All personnel on site are trained to call the emergency telephone number at the first sign of fire. Therefore, no interim measure is warranted.
	3. Curb the 2/3 Diesel Generator Cooling Water Pump to ensure availability of this pump if a fire affected the dedicated pumps, by preventing spread of flammable liquids.	See Appendix A for Dresden Units 2&3 discussion of offsite power reliability. The combustible loading in the cribhouse is low. The DG cooling water pump is not needed except for a loss of offsite power. The major combustibles are contained in equipment. Therefore, no interim measures are warranted.

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2&3 Crib House (Cont'd)		
	4. Provide detection throughout the lower elevation to provide equivalent Appendix R separation for redundant service water pump and Diesel Generator (DG) 2/3 cooling water pump cabling.	See Appendix A for Dresden Units 2&3 discussion of offsite power reliability. The DG 2/3 cooling water pump cabling is needed for a loss of offsite power. The outer service water pumps and associated cables are separated by more than 100 feet in the lower elevations. Only one service water pump is needed to support hot shutdown of both units. The cable trays that contain these Unit 2 and Unit 3 power and control cables for the service water pumps, are shown in Figure F-18-2. There are continuous intervening combustibles between these cables. A full time fire watch is being maintained until such time as fire stops can be installed in these intervening cable trays. In addition, the four hatches to the upper elevation provide passage for products of combustibles. Therefore, it is unlikely for fire to spread from one unit's service water pump cables to the other unit's cables. This zone has low combustible loading. The major combustibles are contained in

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2&3 Crib House (Cont'd)		
		individual equipment. The cribhouse has station personnel performing surveillances at least once per shift. All personnel on site are trained to call the emergency telephone number at the first sign of fire. Therefore, no interim measure is warranted.
	5. Provide automatic, open-head suppression over 2/3 Diesel Generator Cooling Water Pump to ensure availability of this pump if a fire has affected either dedicated pump.	See Appendix A for Dresden Units 2&3 discussion of offsite power reliability. The combustible loading in the cribhouse is low. This equipment is needed for a loss of offsite power. Therefore, no interim measures are warranted.
	6. Provide a curb along the entire column line B at 517'-6" and 509'-6" to ensure the availability of at least one service water pump by preventing spread of flammable liquids.	The combustible loading in the cribhouse is low. Further, the major combustibles are contained in equipment. The cribhouse has station personnel performing surveillances at least once per shift. All personnel on site are trained to call the emergency telephone number at the first sign of fire. Therefore, no interim measures are warranted.

TABLE 2

INTERIM COMPENSATORY MEASURES (Cont'd)

ZONE/AREA	MODIFICATION	INTERIM JUSTIFICATION OR MEASURE
Dresden 2&3 Crib House (Cont'd)		
	7. Provide suppression for upper Elevations 517'-6" and 509'-6" to provide equivalent Appendix R separation for redundant service water pumps and associated cables.	The outer service water pumps and associated cables are separated by more than 100 feet in the upper elevations. Only one service water pump is needed to support hot shutdown of both units. The power and control feeds for the service water pumps are routed in conduits into cable tray in the lower elevation (See Figure F-18-2). Therefore, it is unlikely for fire to spread from one unit's cables to the other unit's cables. This zone has low combustible loading. The major combustibles (oil) are contained in individual equipment. The cribhouse has station personnel performing surveillances at least once per shift. All personnel on site are trained to call the emergency telephone number at the first sign of fire. Therefore, no interim measure is warranted.
	8. Provide a curb along entire column line 4 on Elev. 517'-6" and Elev. 509'-6" to ensure availability of at least one service water pump by preventing the spread of flammable liquids.	In general, the combustible loading in the cribhouse is low. Further combustible liquids are contained in equipment. There is an interim procedure for management to evaluate the cribhouse for unnecessary combustibles and ensure the prompt removal once a working day. No further interim measure is warranted.

APPENDIX A

DISCUSSION OF OFFSITE POWER RELIABILITY

DRESDEN UNITS 2&3

DISCUSSION OF OFFSITE POWER RELIABILITY

Dresden Station Units 2&3 is requesting that for the interim (August 1984 through March 1985) the NRC accept the position that a Loss of Offsite Power (LOOP) in conjunction with a catastrophic fire which affects multiple safe shutdown equipment will not occur.

Summary of Current Offsite Power Configuration

The primary source of offsite power to Dresden Unit 2 is from the 138-kV switchyard (Bus 1) through Reserve Auxiliary Transformer 22 (see Figure A-1). This transformer can also be fed directly from 138-kV Bus 3. The primary source of offsite power to Dresden Unit 3 is from the 345-kV (red bus) through Reserve Auxiliary Transformer 32 (see Figure A-1). This transformer can also be fed directly from 345-kV (blue bus). Furthermore, the 345-kV switchyard (red bus) and the 138-kV switchyard are tied through an autotransformer (TR-83), and the 345-kV (blue bus) is tied to the 138-kV switchyard through another autotransformer (TR 81). An inter-unit 4-kV bus tie exists between the essential reactor building switchgear of Units 2&3 (see Figure A-2). Thus, with the loss of all primary offsite power sources to one unit, offsite power to that unit can be maintained through the bus ties between units. There are a total of 11 lines (5 at 138-kV and 6 at 345-kV) feeding offsite power to the Dresden Units 2&3 switchyard (See Figure A-3).

In order for a total loss of offsite power to occur at Dresden Units 2&3, it would be necessary for both transformers 22 and 32 to be out of service or a loss of power to both transformers.

LOOP Event Study

When evaluating offsite power loss events, it is best to segment the causes into three categories:

1. Grid collapse
2. Weather
3. Plant centered.

A review of Figure A-3 indicates that a LOOP due to grid collapse is unlikely to occur. Dresden Station receives offsite power from the Commonwealth Edison 765, 345 and 138-kV grid through 8 separate connections. These connections are through five transmission substations (Electric Junction, Goodings Grove, Bradley, Pontiac Midpoint, and Mazon) and three fossil generating stations (Powerton, Joliet, and Will County). Additionally, the Edison grid is interconnected with neighboring systems including over twenty-eight 765, 345, and 138-kV transmission lines.

In discussiong the LOOP event due to weather, it must be emphasized that we are postulating this event to occur in a time frame limited to August 1984 through March 1985. This time frame is past the peak severe weather period for tornadoes (April and May) (Reference 1). Historically, Dresden Units 2&3 have not experienced an offsite power loss due to any cause, including weather (Reference 2). Dresden Unit 1 did lose offsite power in 1968 due to a tornado, but subsequent to this event, an additional right-of-way (345-kV switchyard) going south was added (see Figure A-1). Considering that 11 lines converge on the station over seven ROW's from the north, east, south, and west to feed the multiple switchyard, it is unlikely that a weather induced LOOP could occur.

Plant centered events are those where an initiating event (i.e., breakers, relays, etc.) or human error produces a loss of offsite power. Considering that the two primary offsite power sources are fed between them, it is unlikely that a plant-centered event could cascade to the point where all sources would be lost.

References

1. "Climates of the United States", published by the U.S. Department of Commerce.

2. EPRI Report (to be published), "Losses of Offsite Power at U.S. Nuclear Power Plants."

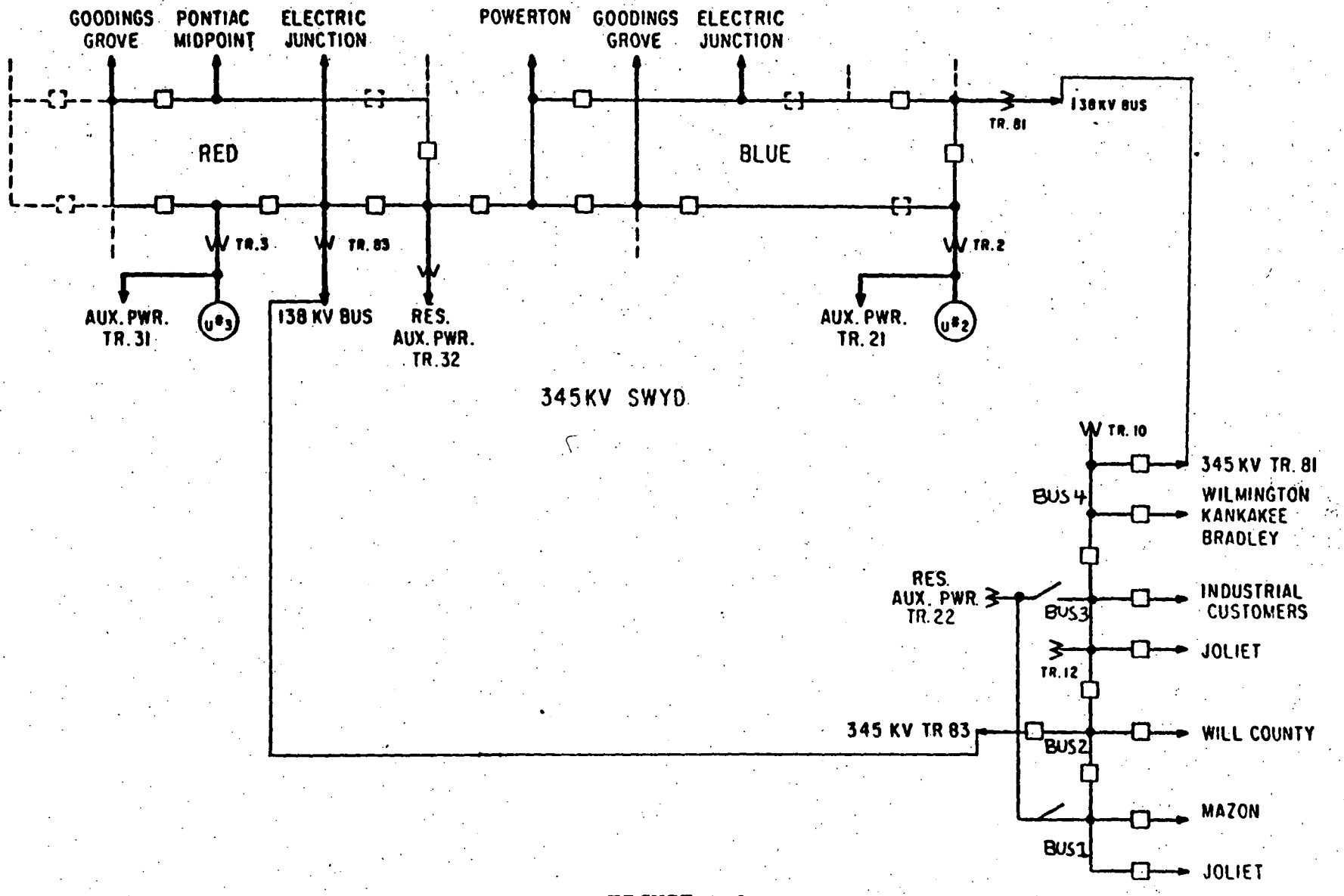
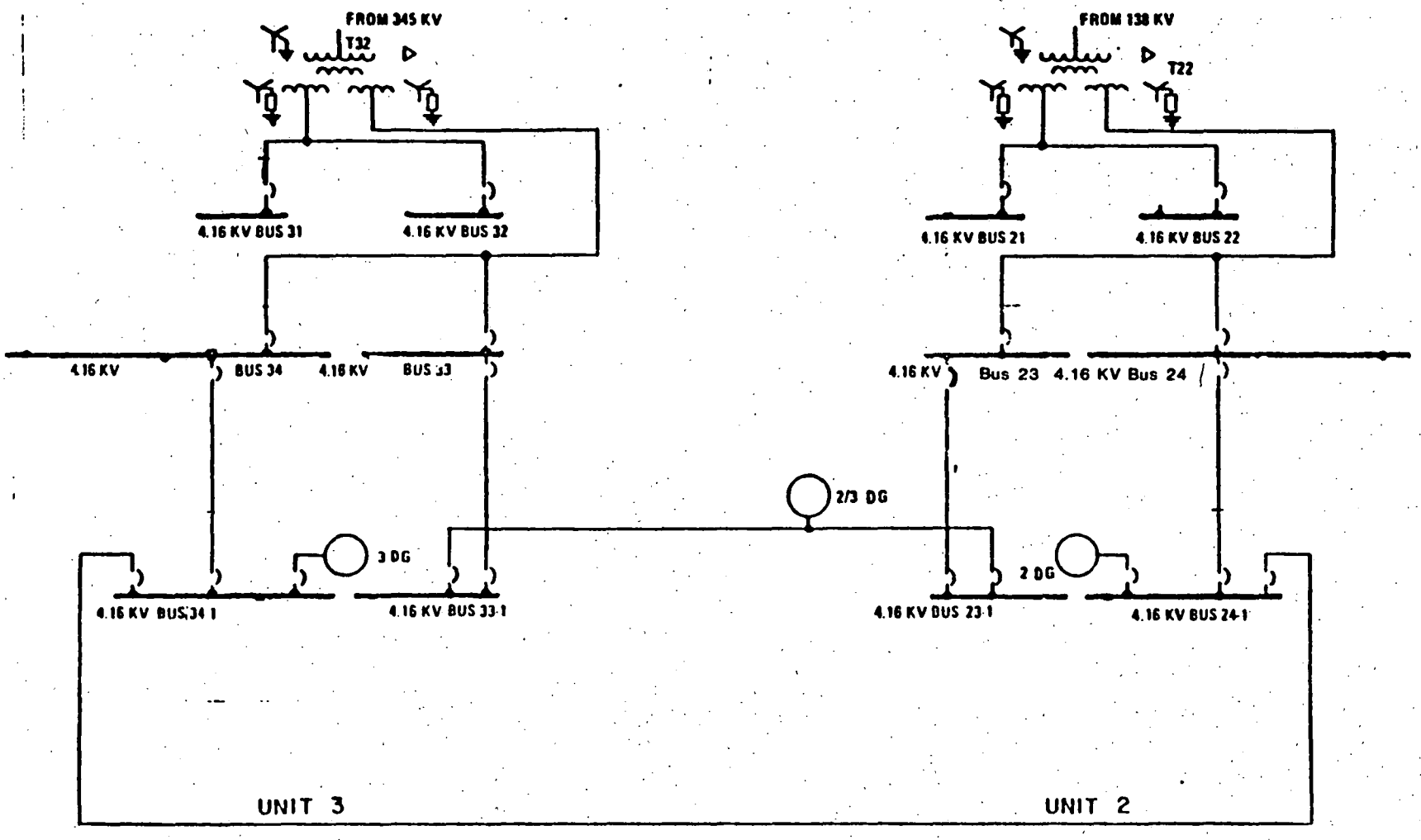


FIGURE A-1

SINGLE LINE DIAGRAM 345KV, 138KV SWYD'S



DRESDEN STATION
UNITS 2 & 3

Auxiliary Electrical System
- 4160 Volt

FIGURE A-2

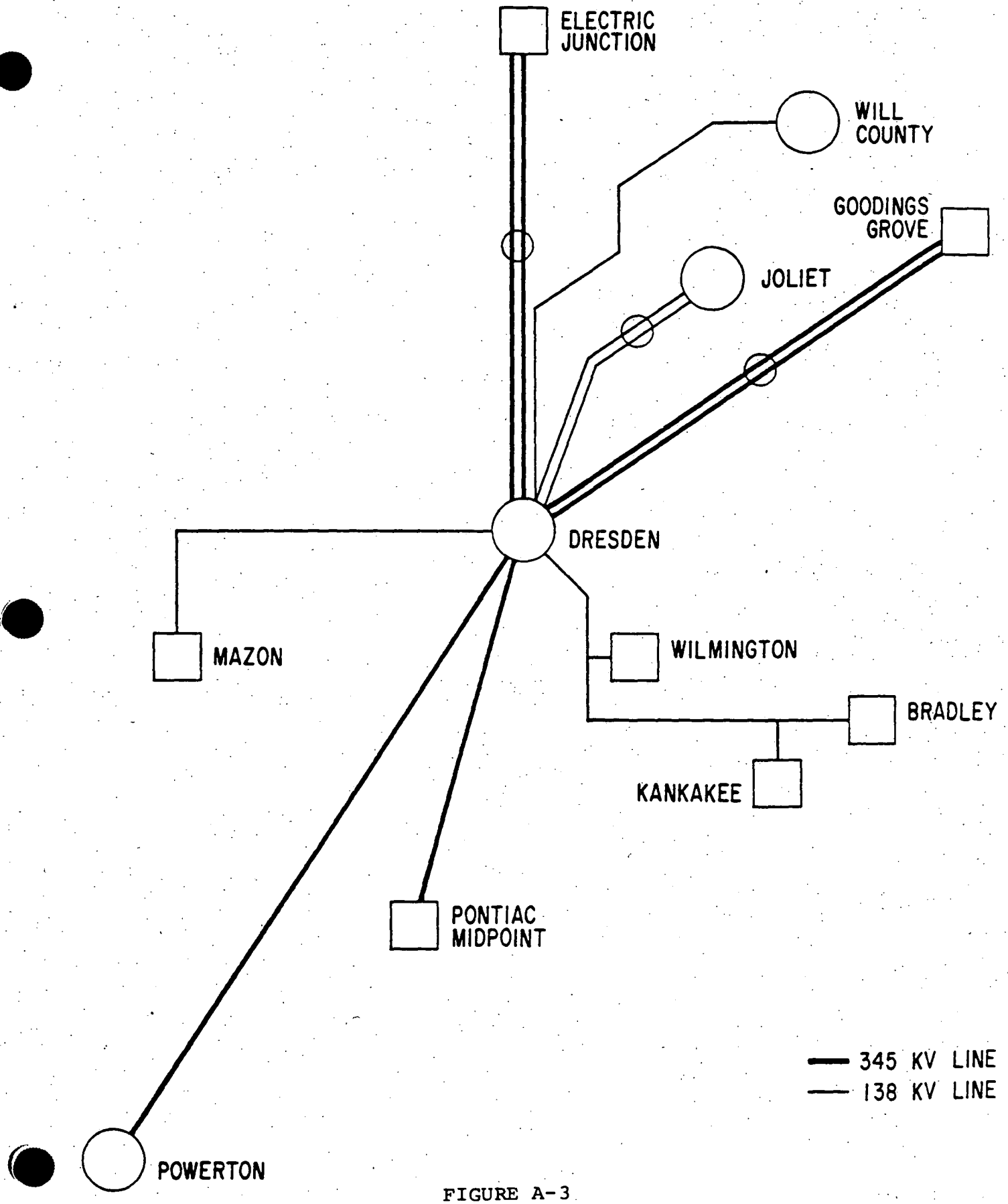


FIGURE A-3

TRANSMISSION SYSTEM INTERCONNECTIONS